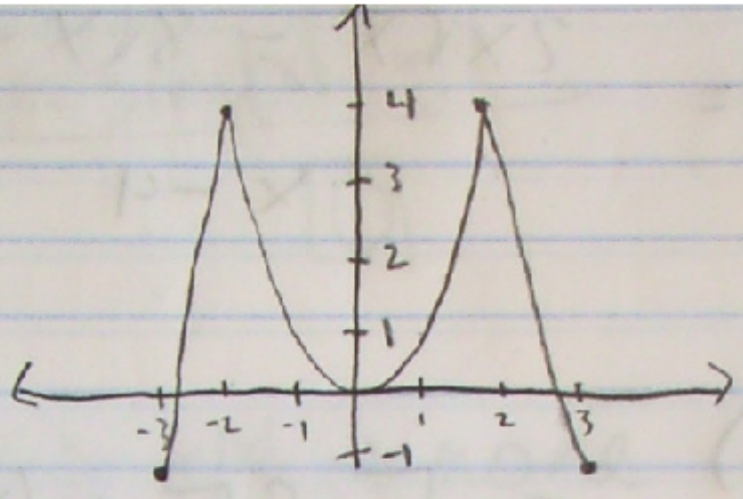
3.2

#5-10

graph the derivative of each

10.




From $-3 \to -2$

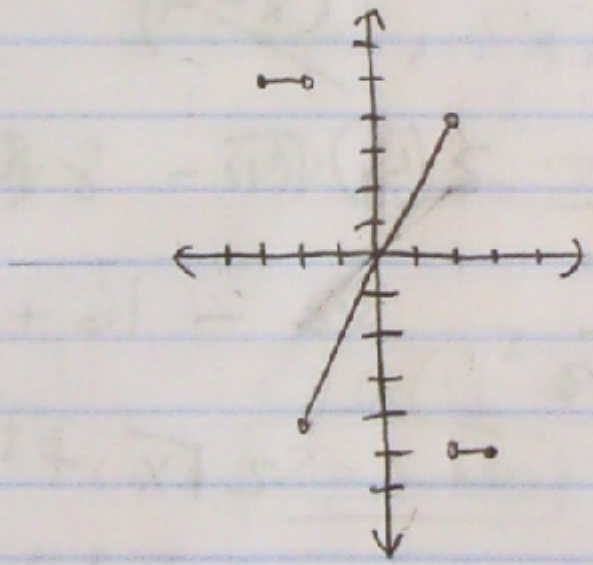
$y = 5x$

$y' = 5$

From $-2 \to 2$

$y = x^2$

$y' = 2x$

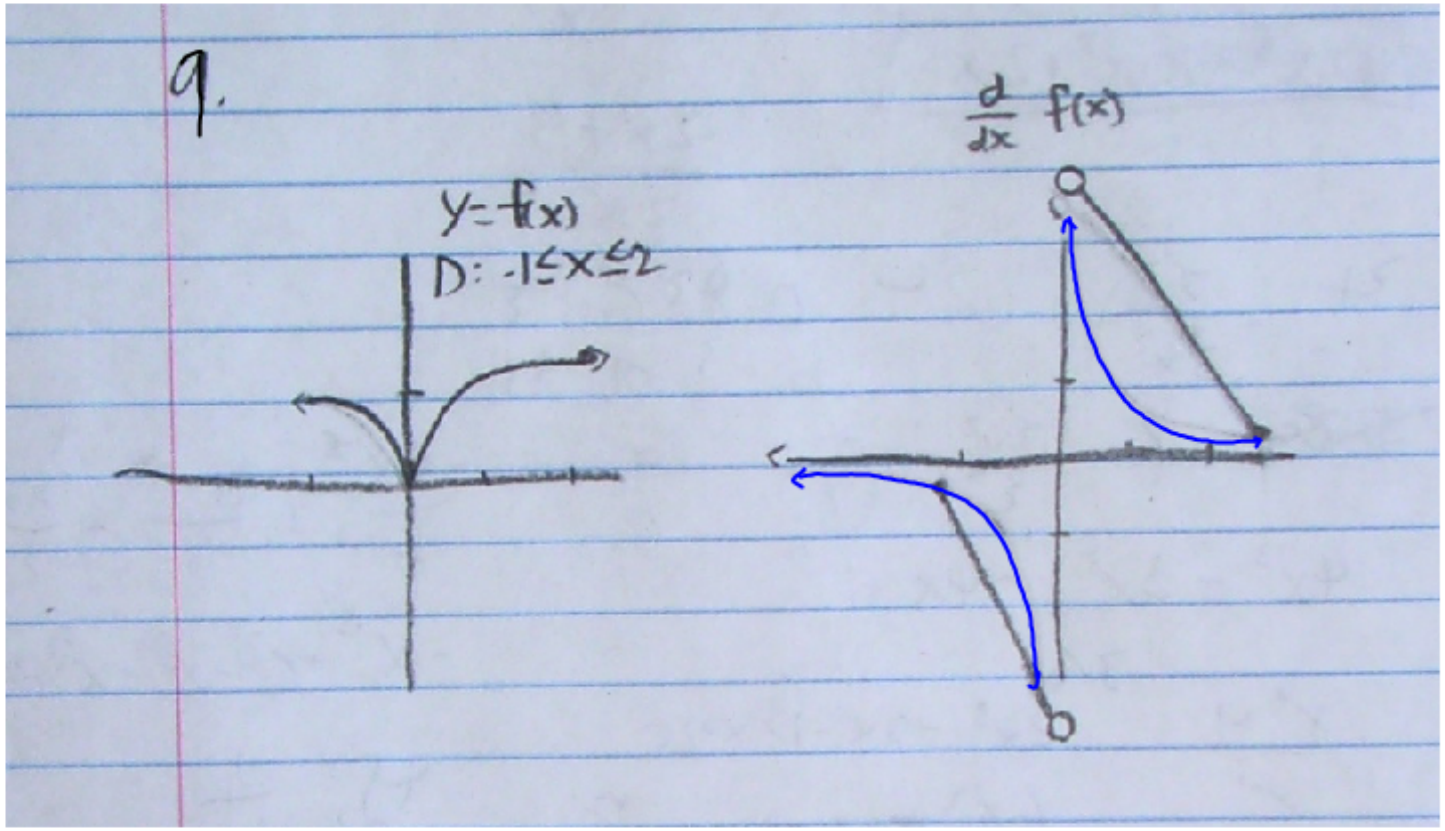


From $2 \to 3$

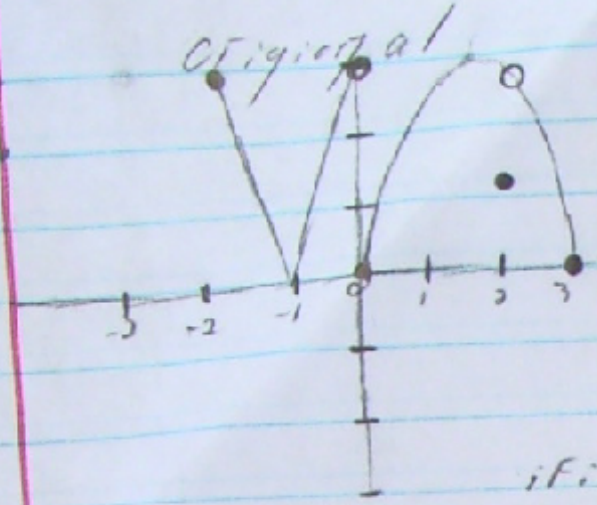
$y = -5x$

$y' = -5$

9.



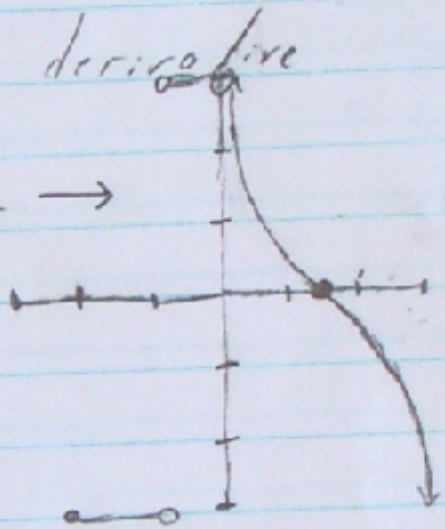
8




From $-2 \to -1$ $m = -3$

From $-1 \to 0$ $m = 3$

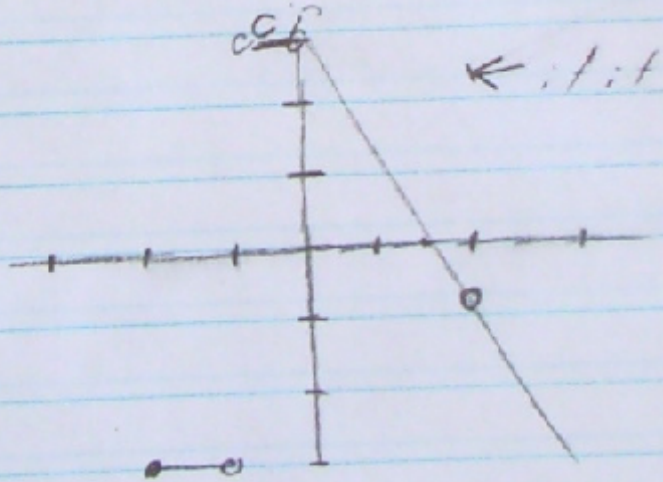
@ 1.5 $m = 0$



derivative

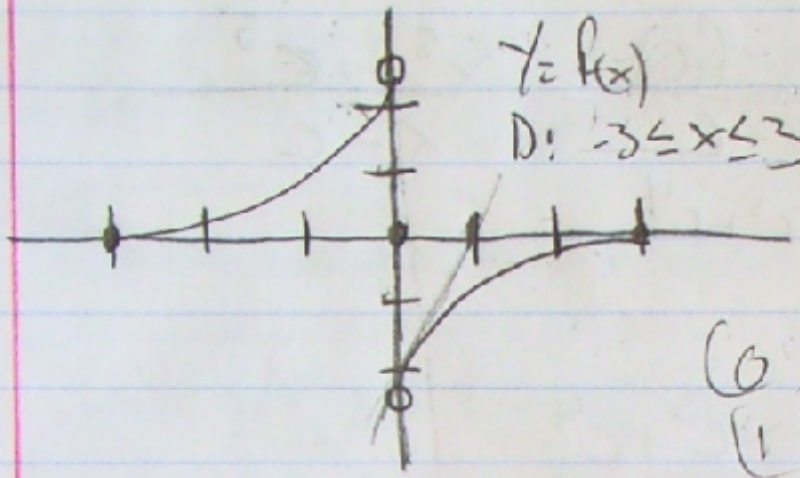
if it is a quartic $\to$ $x^4$

c)



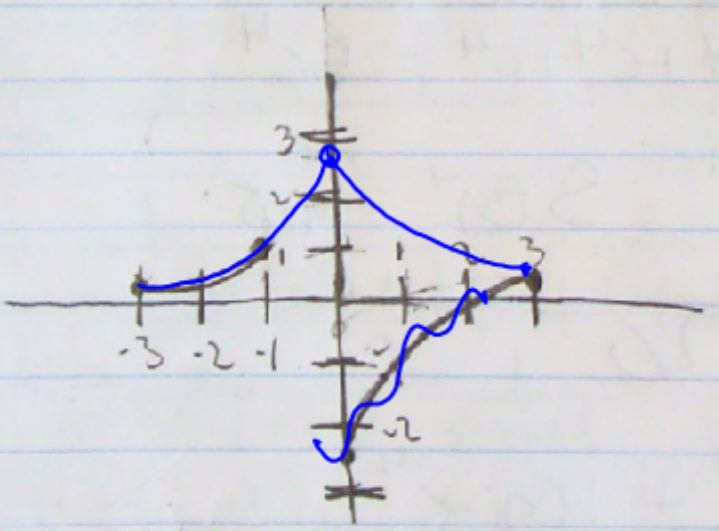
$\leftarrow$ if it is a quadratic $x^2$

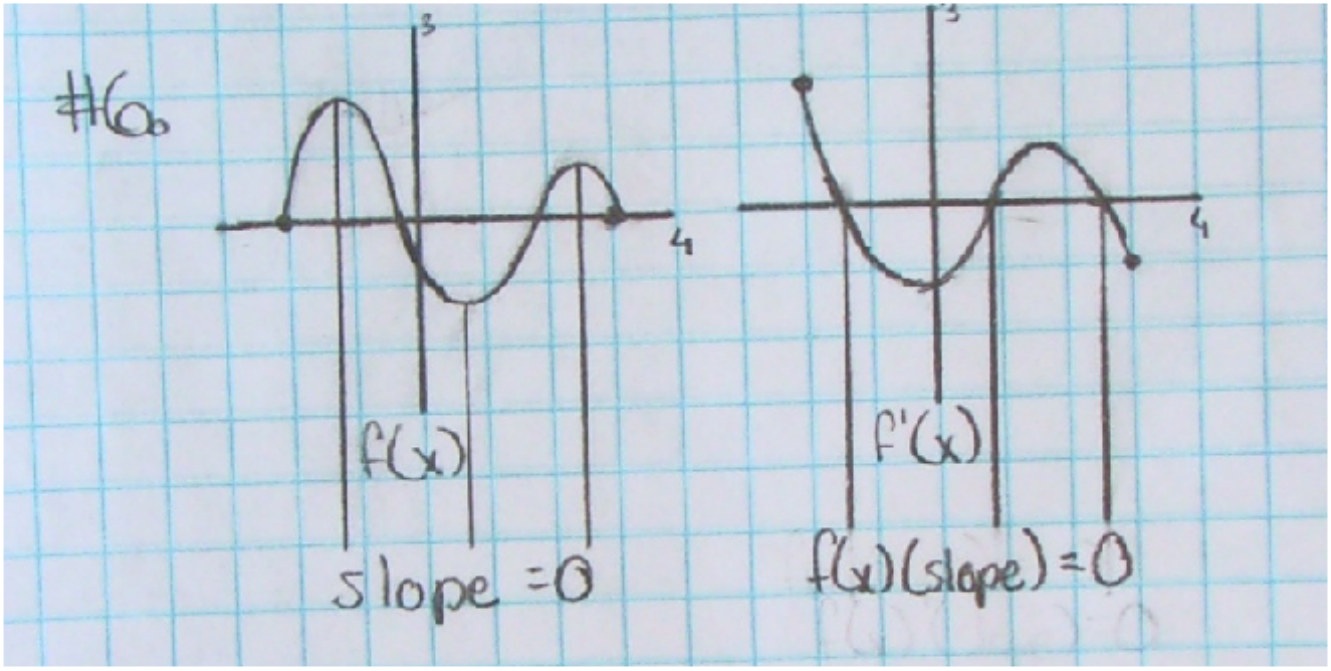
7.

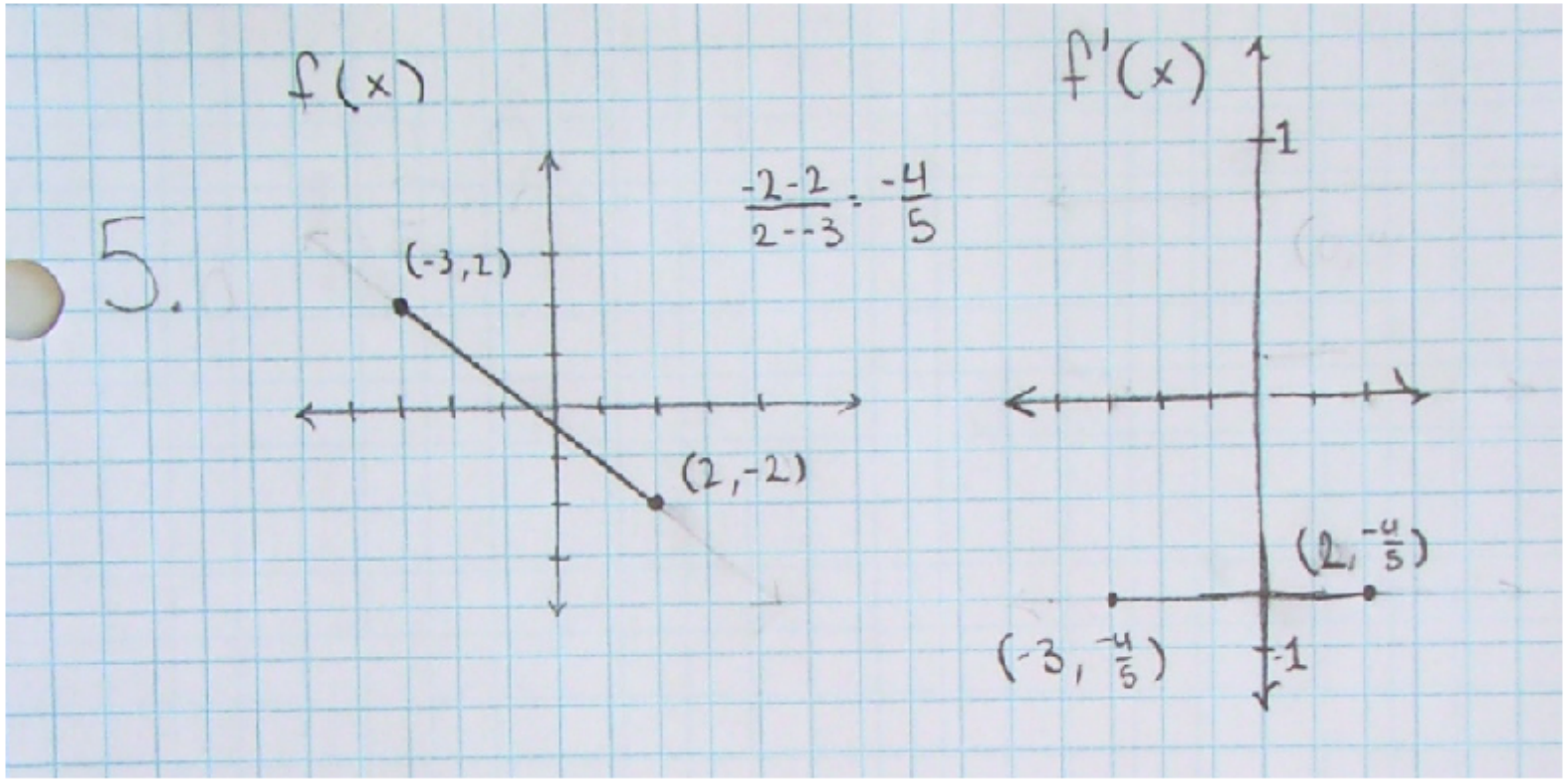



(0, -2.5)
(1, 0)

$\frac{0 - 2.5}{1 - 0} = 2.5$




#6b
3
4
f(x)
slope =0
3
4
f'(x)
f(x)(slope)=0


5.
f(x)
(-3,2)
(2,-2)
$\frac{-2-2}{2--3} = \frac{-4}{5}$
f'(x)
1
-1
$(2, \frac{-4}{5})$
$(-3, \frac{-4}{5})$

Sect. 3.3

46 - Jen

51 - Mike's group

21 - Tony's group

47 - Buck group

27 - Nick group

30 - Wyatt group

36 - Matt group

47.)

$y = 4.9t^2$

$y' = 9.8t$

$y'' = 9.8$

$\frac{d^2y}{dx^2}$

$y'' = \frac{dy'}{dx} = \frac{d}{dx}\left(\frac{dy}{dx}\right) = \frac{d^2y}{dx^2}$

46. $P = \frac{nRT}{V-nb} - \frac{an^2}{V^2}$

$nRT\left(\frac{1}{V-nb}\right)$

$\frac{(V-nb)(0)-(1)(1)}{(V-nb)^2} = \frac{-1}{(V-nb)^2}$

$\frac{-nRT}{(V-nb)^2} + \frac{2an^2}{V^3}$

$\frac{an^2}{V^2} \rightarrow (an^2)V^{-2}$

$= \frac{-2an^2}{V^3}$

21) $f(x) = \frac{x^2}{1-x^3}$

Q.R. $= \frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$

$u = x^2$, $v = 1-x^3$, $\frac{du}{dx} = 2x$, $\frac{dv}{dx} = -3x^2$

$f'(x) = \frac{(1-x^3)(2x)) - (x^2(-3x^2))}{(1-x^3)^2}$

$f'(x) = \frac{2x - 2x^4 + 3x^4}{(1-x^3)^2}$

$$\boxed{f'(x) = \frac{x^4 + 2x}{(1-x^3)^2}}$$

$(1-x^3)(1-x^3)$

$1 - x^3 - x^3 + x^6$

91. $P(x) = t(x)\,y(x)$

$t(x)$ = # trees / grove

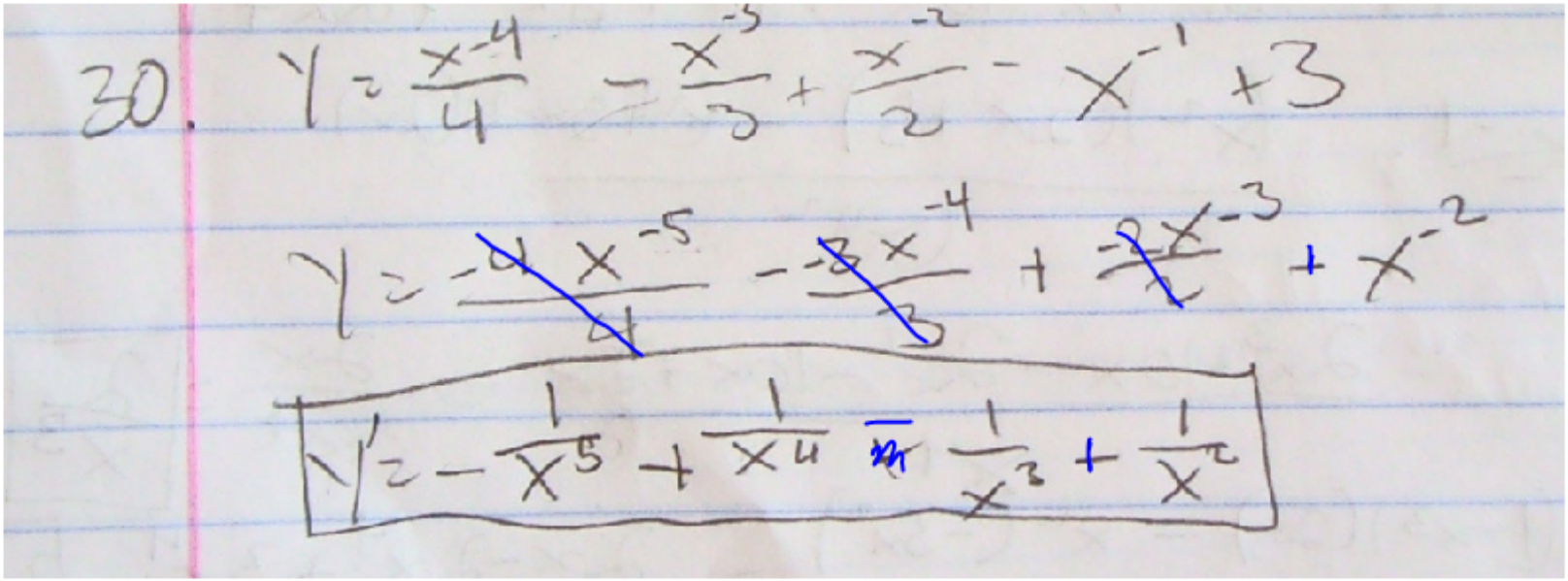
$y(x)$ = yield / tree

$t(0) = 156$ $\quad y(0) = 13$

$t'(0) = 12$ $\quad y'(0) = 1.5$

$P'(0) = 156 \cdot 13$

$P'(0) = (156 \cdot 1.5) + (13 \cdot 12) = 390$ bushels


30. $y = \frac{x^{-4}}{4} - \frac{x^{-3}}{3} + \frac{x^{-2}}{2} - x^{-1} + 3$
$y = \frac{-4x^{-5}}{4} - \frac{-3x^{-4}}{3} + \frac{2x^{-3}}{2} + x^{-2}$
$y' = -\frac{1}{x^5} + \frac{1}{x^4} - \frac{1}{x^3} + \frac{1}{x^2}$

(27) $y = \frac{x^3+1}{2x}$ at $x=1$ pt $= (1,1)$

$y = \frac{x^2}{2} + \frac{1}{2x}$ $y = \frac{1}{2}x^2 + \frac{1}{2}x^{-1}$ $y' = x + -\frac{1}{2x^2}$ $y'(1) = \frac{1}{2}$

tangent $\Rightarrow$ $\boxed{y = \frac{1}{2}(x-1)+1 \quad \text{or} \quad y = \frac{1}{2}x + \frac{1}{2}}$

HW Sect. 3.3 #2-38 (every 3rd problem), 48